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| 26211 7590 02/17/2011<br>FISH & RICHARDSON P.C. (NY)<br>P.O. BOX 1022<br>MINNEAPOLIS, MN 55440-1022 |             |                      |                     |                  |
| EXAMINER  |             |                      |                     |                  |
| COX, ALEXIS K   |             |                      |                     |                  |
| ART UNIT  |             | PAPER NUMBER         |                     |                  |
| 3785  |             |                      |                     |                  |
| NOTIFICATION DATE   |             | DELIVERY MODE        |                     |                  |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

### Office Action Summary

**Application No.**

10/575,720

**Applicant(s)**

SJODIN ET AL

**Examiner**

ALEXIS K. COX

**Art Unit**

3785

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 December 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 31, 34, 36-49, 52 and 54-66 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 31, 34, 36-49, 52 and 54-66 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 12/07/2010
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 31,34,36-49,52 and 54-66 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "about" in "between about 20 and 50 micrometers" in claims 31, 49, and 61 is a relative term which renders the claim indefinite. The term "about" in "between about 20 and 50 micrometers" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Setting the range limitations to "between about 20 and 50 micrometers" does not provide any specific edges of the appropriate thickness range; indeed, on a galactic scale, for example, a thickness of 3 feet is "about" 50 micrometers.

Claims 34, 36-48, 52, 54-60, and 62-66 are rejected as dependent upon independent claims 34, 49, and 61.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 31, 34, 36-41, 44-47, 49, 52, 54-56 and 58-66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuerschbach et al. (US Patent No. 4,815,534) in view of Usui (US Patent No. 4,223,826) and Mizuhara (US Patent No. 4,497,722), further in view of Wells (US Patent No. 3,675,311).

Regarding claims 31, 34, 36-41, 44-47, 63, and 64, Fuerschbach et al. teach a plate heat exchanger (10, see column 4 lines 25-26) comprising a number of heat exchanger plates (see column 2 lines 8-11), which are arranged beside each other and connected to each other by means of a braze connection (see column 5, lines 15-16)

accomplished by means of a braze process (see column 6 lines 59-64; claim 34), wherein the heat exchanger plates are substantially manufactured in stainless steel containing chromium (see column 6 lines 18-20), wherein the plate heat exchanger includes a number of port channels extending through at least some of the heat exchanger plates (40, 41, 40a, 41a, see column 5 lines 49-54) including an outer heat exchanger plate, wherein one or more of the port channels are surrounded by a connection surface (22, see column 5 lines 49-50), which is the portion of the braze alloy sheet which connects the port channels to the pipe member by surrounding the port channel via the connection member, and is for connection of the one or more port channels to a pipe member (see column 5 lines 66-67), as pipes are what pipe nipples connect to. Fuerschbach et al. further teach the connection member to be designed as a pipe nipple (IH, OH, see column 5 lines 66-67), with the connection surface being that portion of the pipe nipple which changes composition by brazing with the braze alloy sheet. It is noted that Fuerschbach et al. do not explicitly teach the connection surface to include a material to permit brazing of the pipe member to the connection surface in a more easy manner than to stainless steel, the material being more reduction susceptible than chromium dioxide, or for that material to be based on nickel. However, the method of Usui teaches the use of a connection surface between stainless steel and stainless steel or another metal (see column 2 lines 49-53), where the connection surface is prepared for a later connection, and does not melt when the material is brazed (see abstract of Usui). Additionally, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the system of Fuerschbach et al. using the

brazing technique of Usui, as the brazing of Usui results in a stronger bond than traditional brazing methods. Mizuhara teaches 5-35% palladium, 20-84% copper, and 10-50% nickel as a brazing alloy (column 1, lines 59-65). The available percentages of materials taught by Mizuhara include brazing alloys based on nickel. Therefore, the substitution of the brazing alloy of Mizuhara would have been obvious to one of ordinary skill in the art at the time of the invention, as the brazing alloy of Mizuhara is structurally equivalent to that of Usui, and a simple substitution does not render a structure patentably distinct over an existing structure. Further, regarding claims 31, 34, and 36, the examiner recognizes that these claims are deemed "product-by-process" type claims. In product-by-process claims, "once a product appearing to be substantially identical is found and a 35 U.S.C. 102/103 rejection [is] made, the burden shifts to the applicant to show an unobvious difference." MPEP 2113.

It is further noted that Fuerschbach et al., Usui, and Mizuhara do not explicitly disclose the connection surface material to have a thickness between 20 and 50 micrometers. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to determine through routine experimentation the appropriate coating thickness for the materials used to produce the strongest bond.

It is further noted that Fuerschbach et al., Usui, and Mizuhara do not explicitly teach the material to be bound to the stainless steel by diffusion. However, the method of Wells teaches the material of Fuerschbach et al. in view of Usui and Mizuhara to be bound to the stainless steel by diffusion brazing (see column 1 lines 67-70). Further, it would have been obvious to one of ordinary skill in the art at the time of the invention to

use the method of Wells to modify the system of Fuerschbach et al. in view of Usui and Mizuhara in order to perform diffusion brazing, which results in a stronger joint strength.

Regarding claims 49, 52, 54-55 and 58-60, the structural requirements of the method of these claims is filled by the system of Fuerschbach et al. when manufactured with the method of Usui and the material substitution of Mizuhara, with the modification of Wells, as shown above. Further, the step of brazing may take place at vacuum-like pressure (see column 6 lines 60-61 of Fuerschbach et al.) or in an atmosphere with substantially inert air gas (see column 2 lines 13-15 of Fuerschbach et al.), and brazing causes material to be bound through diffusion by definition, as can be seen from the Encyclopedia Britannica article referenced below. Additionally, the method of Fuerschbach et al. as modified by the method of Usui requires applying the connection member to the outer surface area at each port channel before the joining of heat exchanger plates (see column 6 lines 56-64) and applying the material for forming the connection surface during the braze process.

Regarding claim 56, it is noted that the combination of Fuerschbach et al., Usui, and Mizuhara do not explicitly teach the material to be bound to the stainless steel by diffusion. However, the method of Wells teaches the material of Fuerschbach et al. in view of Usui and Mizuhara to be bound to the stainless steel by diffusion brazing (see column 1 lines 67-70). Further, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the method of Wells to modify the system of Fuerschbach et al. in view of Usui and Mizuhara in order to perform diffusion brazing, which results in a stronger joint strength.

Regarding claims 61 and 62, the structural requirements of the method steps of these claims is filled by the system of Fuerschbach et al. when manufactured with the method of Usui and the material substitution of Mizuhara, and the method modification of Wells, as shown above. Further, the step of brazing may take place at vacuum-like pressure (see column 6 lines 60-61 of Fuerschbach et al.) or in an atmosphere with substantially inert air gas (see column 2 lines 13-15 of Fuerschbach et al.). Additionally, the method of Fuerschbach et al. as modified by the method of Usui requires applying the connection member to the outer surface area at each port channel before the joining of heat exchanger plates (see column 6 lines 56-64 of Usui), and for pressing the plates to be brazed together to be part of the conventional brazing process (see column 1 lines 9-13 of Usui), and the arrangement of the parts being brazed to be "by a conventional method" (see column 3 lines 5-7 of Usui), thereby disclosing pressing the plates together. As the purpose of Usui is to be a method of brazing stainless steels, and Fuerschbach et al. discloses a brazed heat exchanger, the use of the method of Usui for the manufacture of the product of Fuerschbach et al. would have been obvious to one of ordinary skill in the art at the time of the invention.

Regarding claim 66, the later connecting of the method of Usui is a brazing process (see abstract of Usui).

7. Claims 42, 43, and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fuerschbach et al. (US Patent No. 4,815,534) in view of Usui (US Patent No. 4,223,826) and Mizuhara (US Patent No. 4,497,772), and further in view of



Wells (US Patent No. 3,675,311) and furthermore in view of the Encyclopedia Britannica 15th edition brazing article.

Regarding claims 42 and 43, the system of Fuerschbach et al. in view of Usui teaches the material to have been applied onto the primary surface by means of and during a braze process, as shown above. It is noted that the system and method of Fuerschbach et al. in view of Usui and Mizuhara do not teach the use of abrasive blasting or any similar roughening process to facilitate the wetting of the primary surface with the material. However, it is well-known that "preparation of the surfaces by mechanical or chemical cleaning is important for brazing" (Encyclopedia Britannica, 15h edition, volume 2, page 489, brazing, lines 29-31 of the article; claim 42), and it would therefore have been obvious to one of ordinary skill in the art at the time of the invention to use mechanical abrasive cleaning in place of a chemical bath in the system of Fuerschbach et al in view of Usui and Mizuhara. Further regarding claims 42 and 43, the examiner notes that the patentability of a product is not determined by means of production, but by the end product itself, and therefore the process is given little patentable weight provided all structural limitations are met.

Regarding claim 57, it is noted that the method of Fuerschbach et al. in view of Usui and Mizuhara do not explicitly teach the use of abrasive blasting or any similar roughening process to facilitate the wetting of the primary surface with the material. However, it is well-known that "preparation of the surfaces by mechanical or chemical cleaning is important for brazing" (Encyclopedia Britannica, 15h edition, volume 2, page 489, brazing, lines 29-31 of the article), and it would therefore have been obvious to one

of ordinary skill in the art at the time of the invention to use mechanical abrasive cleaning in place of a chemical bath in the system of Fuerschbach et al. in view of Usui and Mizuhara and further in view of Wells.

8. Claim 48 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fuerschbach et al. (US Patent No. 4,815,534) in view of Usui (US Patent No. 4,223,826), Mizuhara (US Patent No. 4,497,772), and Wells (US Patent No. 3,675,311), and further in view of Blomgren (US Patent No. 6,016,865).

Regarding claim 48, it is noted that the system of Fuerschbach et al. in view of Usui, Mizuhara, and Wells does not explicitly teach the use of a washer for the connecting member. However, Blomgren teaches the use of a washer (15, see column 4, lines 7-9) as a connection member, and wherein the washer is brazed to the heat exchanger of Blomgren. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the washer of Blomgren in the system of Fuerschbach et al. in view of Usui and Mizuhara as a connector in order to reduce material costs to the manufacturer of the heat exchanger, displacing them to the manufacturer of pipes and surrounding equipment. Further regarding claim 48, the examiner notes that the patentability of a product is not determined by means of production, but by the end product itself, and therefore the process is given little patentable weight provided all structural limitations are met.

#### ***Response to Arguments***

9. Applicant's arguments filed 12/07/2010 have been fully considered but they are not persuasive. The reasons are as follows.

It is argued on page 10 that the presence of the connection surface for later connection of the port channels to a pipe member is not met by the rejection.

However, the method of Usui is explicitly disclosed as involving coating a metal with another metal which is then easier to braze, such that coating does not melt when the braze connection is formed (see above rejection; see also abstract of Usui). The fact that Usui alone does not disclose the exact materials as claimed, or that Fuerschbach et al. alone does not perform the method claimed, is not, in fact, convincing; rather, it is the combination which is in the rejection. The actual method of Usui is not material-dependent; it is that of putting a different metal, which brazes more easily, onto an item made of something which brazes less easily, in order to form a suitable connection surface.

Thus, in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

It is further argued that the material substitution of Mizuhara would not result in the connection surface itself having nickel in it.

This is a simple substitution of materials. Further, as the melting point of nickel is higher than that of copper, a material substitution of the brazing material only instead of the connection surface material also would result in a different method, as the copper coating would melt before a nickel-based brazing material melted. This renders the

change of copper connection surface to nickel-based connection surface when changing brazing materials obvious. The actual method of Usui is not material-dependent; it is that of putting a different metal, which brazes more easily, onto an item made of something which brazes less easily, in order to form a suitable connection surface.

It is argued on page 15 that Wells does not make up for the supposed deficiencies of Fuerschbach, Usui, and Mizuhara.

Wells does not need to relate to plate-type heat exchangers with stainless steel plates in order to relate to a technique of brazing; all elements argued to be missing from Wells are present in Fuerschbach, Usui, and Mizuhara.

Thus, in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

This is also true for claim 56.

Regarding claims 42 and 43, argued on pages 16 and 17, the Encyclopedia Britannica is not applied for anything other than to indicate how well-known preparing surfaces by mechanical or chemical polishing for brazing is; again, applicant's argument presented regards the reference separately instead of the combination as a whole.

Regarding claim 48, it is argued on page 17 that the Blomgren patent does not disclose the materials claimed or the connection surface.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Regarding claim 57, the separate argument concerning the Encyclopedia Britannica article presented on page 18 is no more convincing upon repetition.

### ***Conclusion***

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Cottone et al (US Patent No. 5,305,945) discloses a finned heat exchanger assembly assembled by coating aluminum with another material which is easier to braze, and which does not melt in the brazing process. McChesney (US Patent No. 2,731,245) discloses soldering copper to aluminum by first attaching a copper strip to the aluminum by a different means, to make it easier to attach the main copper and aluminum pieces. Certain (US Patent No. 2,763,470) discloses using copper to join aluminum to brass.

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEXIS K. COX whose telephone number is (571)270-5530. The examiner can normally be reached on Monday through Thursday 9:30a.m. to 7:00p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Judy Swann can be reached on 571-272-7075. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ljiljana (Lil) V. Ciric/  
for Judy Swann, SPE of Art Unit 3785

/AKC/